Amendment to the claims

This listing of claims will replace all prior versions, and listing of claims, in the application.

1.-21. (Cancelled)

22. (Currently amended) A method for separating particles in ~~processing~~ a stream of particles having a cross-sectional area, the stream of particles flowing substantially along a stream flow direction, the stream of particles including particles of a first type and particles of a second type, the particles of the first and second types having a mass, a size and a configuration so that they move differently under the influence of aerodynamic forces, said method comprising:

- directing a diluting flow of fluid towards the stream of particles, the diluting flow of fluid flowing substantially along a diluting flow of fluid direction, the diluting flow of fluid having a velocity and density such that the velocity pressure of the fluid produces a diluting impact force on the particles causing the particles to move in a direction substantially parallel to the diluting flow of fluid, thereby increasing the cross-sectional area of the stream of particles; and

- directing a separating flow of fluid towards the stream of particles, the separating flow of fluid flowing substantially along a separating flow of fluid direction, the separating flow of fluid being a jet stream having a velocity and density such that the velocity pressure of the separating flow of fluid produces a separating impact force on the particles of the first and second types, the separating impact force being of a magnitude and a duration such that the particles of the first and second types are separated respectively in a first and a second substream of particles, the first substream of particles including a higher proportion of particles of the first type relative to

the total number of particles than the proportion of particles of the first type relative to the total number of particles present in the stream of particles, the second substream of particles including a higher proportion of particles of the second type relative to the total number of particles than the proportion of particles of the second type relative to the total number of particles present in the stream of particles.

23. (Previously presented) A method as defined in claim 22, wherein the diluting flow of fluid has a velocity and density such that the fluid produces a diluting impact force on the particles causing the particles to move over a first distance in a direction substantially parallel to the diluting flow of fluid while the fluid produces the diluting impact force and to move over a second distance in a direction substantially parallel to the diluting flow of fluid after the fluid has produced the diluting impact force, the diluting impact force being of a magnitude and a duration such that

- the particles are substantially distanced from each other by the diluting flow of fluid; and
- the second distance is substantially larger than the first distance.

24. (Previously presented) A method as defined in claim 23, wherein the diluting flow of fluid is a high velocity pressure jet stream.

25. (Previously presented) A method as defined in claim 22, further comprising diluting the stream of particles by accelerating the stream of particles substantially in the stream flow direction after the fluid produces the diluting impact force on the particles.

26. (Previously presented) A method as defined in claim 25, wherein the stream flow direction is substantially

parallel to a gravitational field in which the stream of particles is accelerated.

27. (Previously presented) A method as defined in claim 26, wherein the diluting flow of fluid direction is substantially perpendicular to the stream flow direction.

28. (Currently amended) A method as defined in claim 22 ~~26~~, wherein said separating flow of fluid is directed towards the stream of particles after said diluting flow of fluid has diluted the stream of particles. ~~the stream of particles includes particles of a first type and particles of a second type, the particles of the first and second types having a mass, a size and a configuration so that they move differently under the influence of aerodynamic forces, said method further comprising directing a separating flow of fluid towards the stream of particles, the separating flow of fluid flowing substantially along a separating flow of fluid direction, the separating flow of fluid being a jet stream having a velocity and density such that the velocity pressure of the separating flow of fluid produces a separating impact force on the particles of the first and second types, the separating impact force being of a magnitude and a duration such that the particles of the first and second types are separated respectively in a first and a second substream of particles, the first substream of particles including a higher proportion of particles of the first type relative to the total number of particles than the proportion of particles of the first type relative to the total number of particles present in the stream of particles, the second substream of particles including a higher proportion of particles of the second type relative to the total number of particles than the proportion of particles of the second type relative to the total number of particles present in the stream of particles.~~

29. (Previously presented) A method as defined in claim 28, wherein the separating impact force on the particles of

the second type is such that the separating flow of fluid is substantially stopped by frictional forces before reaching the second substream of particles.

30. (Previously presented) A method as defined in claim 29, wherein the velocity, dimensions and density of the separating flow of fluid are such that substantially no turbulence is caused by the separating flow of fluid in the second substream of particles.

31. (Previously presented) A method as defined in claim 30, wherein the second substream of particles includes substantially no particles of the first type and wherein the first susbstream of particles includes substantially no particle of the second type.

32. (Previously presented) A method as defined in claim 22, wherein the stream of particles flows in a casing 12, having a casing longitudinal axis, the casing longitudinal axis being substantially parallel to the stream flow direction.

33. (Previously presented) A method as defined in claim 32, wherein the force and duration of the diluting impact force is such that turbulence is created in the stream of particles, the turbulence mixing the particles so that the stream of particles is substantially homogeneous downstream from the diluting flow of fluid.

34. (Previously presented) A method as defined in claim 22, further comprising:

a. injecting a treatment agent in the flow of fluid; and

b. treating at least in part the particles with the treatment agent.

35. (Previously presented) A method as defined in claim 22, wherein the fluid includes a gas.

36. (Previously presented) A method as defined in claim 35, wherein the gas includes air.

37. (Previously presented) A method as defined in claim 36, wherein the gas consists essentially of air.

38. (Currently amended) An apparatus for separating ~~processing a~~ stream of particles into particle groups, said apparatus comprising:

c. a substantially upstanding dilution treatment chamber 12, 102, said dilution treatment chamber, defining an upper chamber 21, end and an opposed lower chamber end 22, 114, said dilution treatment chamber having a chamber passageway 20, extending between said upper and lower chamber ends;

d. a source of compressed fluid; and

e. a nozzle 14, 104, for creating a high velocity pressure jet stream, said nozzle including

i. a nozzle inlet 40, in fluid communication with said source of compressed fluid;

ii. a nozzle outlet 41, in fluid communication with said chamber passageway for releasing the jet stream into said chamber passageway; and

iii. a nozzle passageway 43, extending between said nozzle inlet 40, and said nozzle outlet 41

f. a transfer chamber 13, 106, positioned substantially adjacent said dilution treatment chamber 12, 102;

g. another nozzle including

i. - an other nozzle inlet 40, in fluid communication with said source of compressed fluid;

ii. - an other nozzle outlet 41, in fluid communication with said chamber passageway 20; and

iii. - another nozzle passageway 43, extending between said other nozzle inlet and said other nozzle outlet; and

h. - a transfer aperture 24, 110, extending between said dilution treatment chamber 12, 102, and said transfer chamber 13, 106, said transfer aperture 24, 110, being substantially opposed to said other nozzle output 41, with respect to said transfer chamber 13, 106, said transfer aperture 24, 110, being substantially in register with said other nozzle output 41.

39. (Previously presented) An apparatus as defined in claim 38, wherein the jet stream is a flow of fluid flowing substantially along a flow of fluid direction inside said chamber passageway 20, the flow of fluid having a velocity, a cross-sectional area and density such that the velocity pressure of the fluid produces an impact force on the particles causing the particles to move in a direction substantially parallel to the flow of fluid while the fluid produces the impact force, the particles moving over a first distance in a direction substantially parallel to the flow of fluid while the fluid produces the impact force and moving over a second distance in a direction substantially parallel to the flow of fluid after the fluid has produced the impact force, the impact force being of a magnitude and a duration such that

- the particles are substantially separated from each other by the flow of fluid; and

- the second distance is substantially larger than the first distance

thereby increasing a cross-sectional area of the stream of particles.

40. (Previously presented) An apparatus as defined in claim 39, wherein the stream of particles is accelerated by gravity below said nozzle output 41.

41. (Previously presented) An apparatus as defined in claim 40, wherein the flow of fluid direction is substantially perpendicular to the stream flow direction.

42. (Previously presented) An apparatus as defined in claim 41, wherein the force and duration of the impact force is such that the particles are mixed in the stream of particles so that the stream of particles is substantially homogeneous downstream from the diluting flow of fluid, the particles being mixed by a turbulence created by the flow of fluid in the stream of particles.

43. (Previously presented) An apparatus as defined in claim 42, further comprising a treatment fluid source in fluid communication with said nozzle passageway 40, said treatment fluid source allowing to selectively inject in said chamber passageway 20, a treatment fluid for treating at least in part the particles.

44. (Currently amended) An apparatus as defined in claim 43, ~~further comprising:~~

~~- a transfer chamber 13, 106, positioned substantially adjacent said dilution treatment chamber 12, 102;~~

~~- another nozzle including~~

~~- an other nozzle inlet 40, in fluid communication with said source of compressed fluid;~~

~~- an other nozzle outlet 41, in fluid communication with said chamber passageway 20; and~~

~~- another nozzle passageway 43, extending between said other nozzle inlet and said other nozzle outlet; and~~

~~- a transfer aperture 24, 110, extending between said dilution treatment chamber 12, 102, and said transfer chamber 13, 106, said transfer aperture 24, 110, being substantially opposed to said other nozzle output 41, with respect to said transfer chamber 13, 106, said transfer aperture 24, 110, being substantially in register with said other nozzle output 41;~~

- wherein said other nozzle directs ~~directing~~ an other jet stream in the form of another flow of fluid coming from said source of compressed fluid towards the stream of particles, the other flow of fluid flowing substantially along an other flow of fluid direction in said chamber passageway 12, 102, the other flow of fluid having a velocity and density such that the velocity pressure of the fluid produces an other impact force on the particles causing the particles to move over an other first distance in a direction substantially parallel to the other flow of fluid while the fluid produces the other impact force and to move over an other second distance in a direction substantially parallel to the other flow of fluid after the fluid has produced the other impact force, the other impact force being of a magnitude and a duration such that

  - the particles are substantially separated from each other by the other flow of fluid; and
  - the other second distance is substantially larger than the other first distance;

- the other first and second distances are such that at least some particles are projected through said transfer aperture 24, 110, and into said transfer chamber 13, 106, by the other flow of fluid.

45. (Previously presented) An apparatus as defined in claim 44, wherein the other flow of fluid produced by the other nozzle 14, 104, has a velocity and a volume such that substantially no turbulence is produced in said transfer chamber 13, 106, by the other flow of fluid.

46. (Previously presented) An apparatus as defined in claim 45, further comprising a pre-treatment module 15, 15', provided over said dilution treatment chamber 12, 102, for spreading the stream of particles in a substantially horizontal direction prior to entry in said casing passageway.

47. (Previously presented) An apparatus as defined in claim 46, wherein further comprising a distributor 55, selected from the set consisting of impeller, an ultrasound system, and a reciprocating strainer, said distributor 55 being located substantially upstream of said nozzle 14 and distributing the particle stream over a plane substantially perpendicular to the stream flow direction.

48. (Previously presented) An apparatus as defined in claim 45, wherein said dilution treatment chamber 12, 102, and said transfer chamber 13, 106, are separated from each other by a wall 23, said transfer aperture 24, 110, being formed into said wall 23.

49. (Previously presented) An apparatus as defined in claim 48, further comprising a transfer aperture 24, 110, closing device operable between an open and a closed configuration, wherein

- in said open configuration, said transfer aperture 24, 110, is open so as so allow at least some of the particles and at least part of the flow of fluid to enter the transfer chamber 13, 106; and

- in said closed configuration, said transfer aperture 24, 110, is closed with the gate 26, 206, so as so substantially prevent the particles and the flow of fluid from entering the transfer chamber.

50. (Previously presented) An apparatus as defined in claim 44, further comprising at least one recuperation tray 70, located substantially adjacent and below said transfer aperture 24, 110, in said transfer chamber 13, 106, for collecting and returning particles falling there into to said dilution treatment chamber 12, 102.

51. (Previously presented) An apparatus as defined in claim 38, wherein said nozzle 14, 104, further includes a diffusing body 44, positioned between said nozzle inlet 40, and said nozzle outlet 41, said diffusing body 44, creating a substantially uniform flow of fluid at said nozzle outlet 41.

52. (Previously presented) An apparatus as defined in claim 51, wherein said nozzle 14, 104, includes a gate 45, movable between an open position and a closed position, wherein in said open position, said gate is substantially retracted from said nozzle outlet and in said closed position, said gate substantially covers said nozzle outlet.

53. (Previously presented) An apparatus as defined in claim 52, wherein moving said gate 45, at a predetermined position between said open and closed positions controls the cross-sectional area and velocity of the flow of fluid so that the velocity of the flow of fluid is a predetermined velocity and the cross-sectional area of the flow of fluid is a predetermined cross-sectional area.

54. (Previously presented) An apparatus as defined in claim 38, wherein said dilution treatment chamber 12, 102, and said transfer chamber 13, 106, are substantially elongated and define respectively a chamber longitudinal axis and a transfer chamber longitudinal axis, said dilution treatment chamber and transfer chamber longitudinal axes being substantially parallel.

55. (Previously presented) An apparatus as defined in claim 54, wherein said dilution treatment chamber 12, 102, is substantially parallelepiped-shaped.

56. (Previously presented) An apparatus as defined in claim 54, wherein said transfer chamber 13,106, is substantially parallelepiped-shaped.

57. (Previously presented) An apparatus as defined in claim 38, wherein said dilution treatment chamber 12, 102, includes a movable side wall of the passageway 20, movable in a direction substantially parallel to said flow of fluid, said nozzle extending from said movable side wall.

58. (Previously presented) An apparatus as defined in claim 38, wherein said source of compressed fluid includes a source of compressed air.

59. (Previously presented) An apparatus as defined in claim 38, further comprising a pretreatment module positioned over the dilution treatment chamber, said pre-treatment module guiding and spreading substantially horizontally the stream of particles.

60. (Previously presented) An apparatus as defined in claim 59, wherein said pretreatment module 15, 15', has at least one slide portion sloping downwardly toward said dilution treatment chamber 12, for guiding and accelerating the stream of particles towards the dilution treatment chamber 12, 102, and a deflecting surface 51, between said

slide portion 50, and said dilution treatment chamber 12, for spreading out substantially horizontally the steam of particles prior to entry in said passageway 20.

61. (Previously presented) An apparatus as defined in claim 39, wherein said passageway defines a passageway cross-section, said diluting flow of fluid distributing the stream of particles over said passageway cross-section.